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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,792	10/05/2006	Karlheinz Bing	BING ET AL. - 9 PCT	8699

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EXAMINER	
NGUYEN, HUNG Q	
ART UNIT	PAPER NUMBER
3741	
MAIL DATE	DELIVERY MODE
08/06/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/589,792	BING ET AL.	
	Examiner	Art Unit	
	HUNG Q. NGUYEN	3741	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 July 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4 and 8-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4 and 8-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 August 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 07/02/2009 has been entered.

2. This office action is responsive to the amendment filed on 07/02/2009. As directed by the amendment: claims 1, 4 and 9-13 have been amended, claim 3 has been cancelled. Thus, claims ***1, 4 and 8-13*** are presently pending in this application.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. **Claims 1 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kodama (US 7,226,667 B2) in view of Sunada (WO 2004/074667 / US 7,392,771) and Hill (US 6,557,513 B1), and further in view of Oh (US 6,920,859 B2).**

5. **Regarding claim 1**, Kodama discloses a cylinder sleeve 10 (fig. 1-3) for an internal combustion engine wherein the cylinder sleeve 10 is configured as a rough-cast sleeve, the outer surface 16 of which has a roughened region (fig. 1-2) reaching over its entire axial length (col. 7, lines 1-9) and consisting of a plurality of elevations with

undercuts 18 and wherein a height of the elevations is between 0.2 mm to 2 mm (see col. 4, lines 60-63) and wherein the cylinder sleeve 10 has a constant wall thickness.

Furthermore, Kodama discloses the cylinder sleeve as essentially claimed except for the outer surface of which has at least one flattened region reaching over its entire length.

The patent to Sunada (refer to reference '771 since it is identical and in English) discloses that it is conventional in the art of cylinder sleeves to provide a cylinder sleeve 162a-162d (fig. 52), an outer surface of which has at least one flattened region reaching over its entire length.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the cylinder sleeve, as taught by Kodama, to incorporate a cylinder sleeve wherein the outer surface of which has at least one flattened region reaching over its entire length, as suggested and taught by Sunada, for the purpose of providing a lightweight engine block having much smaller wall thickness wherein the engine block is smaller in size due to the reduced length required by the cylinder sleeves, and reducing manufacturing costs (see col. 9, lines 19-27 and 39-54).

Accordingly, Kodama and Sunada, as a combination, teaches a cylinder sleeve wherein the sleeve is configured as a rough-cast sleeve, the outer surface of which has a roughened region reaching over its entire axial length and consisting of a plurality of elevations with undercuts and wherein the height of the elevations is between 0.2 to 2 mm, wherein the cylinder sleeve has a constant wall thickness, and that the outer surface of which has at least one flattened region reaching over its entire axial length.

However, the combination of Kodama and Sunada does not teach that the **outer contour** of the cylinder sleeve is elliptical in cross-section.

On the other hand, Hill teaches that it is conventional in the art to provide a cylinder sleeve comprising an **outer contour that is elliptical** in cross-section (see Abstract).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the cylinder sleeve, as suggested by the of combination of Kodama / Sunada, to employ a cylinder sleeve having an outer contour that is elliptical in cross-section, as suggested by Hill, in order to allow engine designer to reduce overall length of the engine due to shortened bore spacing requirements (see Abstract and col. 4, lines 4-20).

Furthermore, a change in form or shape is generally recognized as being within the level of ordinary skill in the art. *In re Dailey, 149 USPQ 47 (CCPA 1976).*

Thus, the combination of Kodama and Sunada together with the teaching of Hill, provides a cylinder sleeve as essentially claimed.

Accordingly, the combination of Kodama / Sunada / Hill does teach a cylinder sleeve having an outer contour that is formed by a depth of the roughened region that is **constant over the circumference.** Thus, it is clear that the combination of Kodama / Sunada / Hill does not teach that the outer contour is formed by a depth of the roughened region that **varies** over a circumference.

However, the patent to Oh discloses that it conventional to provide a cylinder sleeve 1 (fig. 1-2) comprising an external surface (i.e., outer contour) that is roughened

to provide protrusions 5 with undercuts (3, 15), ***wherein the depth of this roughened region is varied over the circumference of the sleeve 1*** (see col. 2, lines 1-37) for the purpose of providing a strong coupling structure between the liner and the cylinder blocks (see col. 2, lines 32-37).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the cylinder sleeve, as suggested the combination of Kodama / Sunada / Hill, to incorporate a cylinder sleeve wherein its outer contour is formed by **a depth of the roughened region that varies over a circumference**, as suggested and taught by Oh, for the purpose of provided a strong coupling structure between the liner and the cylinder blocks.

Thus, the entire combination leads to a cylinder sleeve for an internal combustion engine, an outer contour of which has at least one flattened region reaching over its entire axial length, an outer contour that is elliptical in cross-section and is formed by a depth of the roughened region that varies over a circumference, said sleeve having a constant sleeve wall thickness, wherein the cylinder sleeve is configured as rough-cast sleeve, the outer surface of which has roughened region reaching over its entire axial length and consisting of a plurality of elevations with undercuts and wherein a height of the elevations is between 0.2 mm to 2 mm.

2. **Regarding claim 8**, Sunada further discloses that the at least one flattened region (see fig. 52) is provided with a step having a flattened region lying radially on the outside, on its lower side facing the crankcase (not shown).

3. **Regarding claim 9**, the claimed phrase "spin casting" is being treated as product-by-process limitations and since it has been held that a product-by-process limitation is not construed as being limited to the product formed by the specific process recited, therefore, even though Kodama is silent as to the process used to produce the cylinder sleeve, it appears that the Kodama's product would be the same or similar as that claimed, especially since both applicant's product and the prior art product is made of cast iron material (col. 4, lines 44-46).

4. **Claims 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kodama / Sunada / Hill / Oh, and further in view of Gohrbandt (US 2005/0150476 A1).**

5. **Regarding claim 10**, Kodama / Sunada / Hill / Oh disclose the cylinder sleeve as essentially claimed except for wherein it consists of an aluminum-silicon alloy.

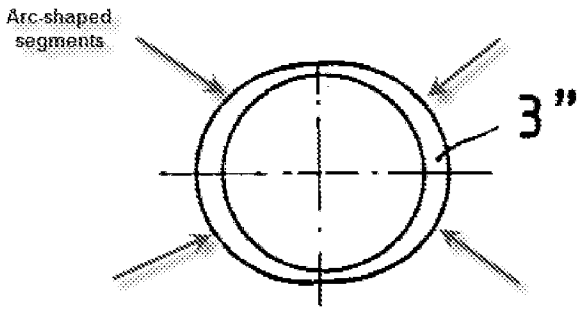
Gohrbandt teaches that it is conventional and well known in the art to provide cylinder sleeves (i.e., liners) which consists of an aluminum-silicon alloy in order to increase the wear resistance of the piston running surfaces (see p. 1, par. 0003; p. 3, par. 0025).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the cylinder sleeve, as taught by Kodama / Sunada / Hill / Oh, to incorporate a cylinder sleeve wherein it consists of an aluminum-silicon alloy, as suggested and taught by Gohrbandt, for the purpose of increasing the wear resistance of the piston running surfaces.

6. Note, it would have also been obvious to one having ordinary skill in the art at the time the invention was made to employ aluminum-silicon alloy as a material for the cylinder sleeve, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

7. **Regarding claims 11-13**, the claimed phrases “gravity casting”, "spin casting" and “lost-foam casting” are being treated as product-by-process limitations and since it has been held that a product-by-process limitation is not construed as being limited to the product formed by the specific process recited, therefore, even though Gohrbandt is silent as to the process used to produce the cylinder sleeve, it appears that the Gohrbandt’s product would be the same or similar as that claimed, especially since both applicant's product and the prior art product is made of aluminum-silicon material (see. P. 3, par. 0041).

FIG. 4



7. **Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kodama (US 7,226,667 B2) in view of Sunada (WO 2004/074667 / US 7,392,771) and Gobbels (US 6,182,629), and further in view of Oh (US 6,920,859 B2).**

8. **Regarding claim 4**, Kodama discloses a cylinder sleeve 10 (fig. 1-3) for an internal combustion engine wherein the cylinder sleeve 10 is configured as a rough-cast sleeve, the outer surface 16 of which has a roughened region (fig. 1-2) reaching over its entire axial length (col. 7, lines 1-9) and consisting of a plurality of elevations with undercuts 18 and wherein a height of the elevations is between 0.2 mm to 2 mm (see col. 4, lines 60-63) and wherein the cylinder sleeve 10 has a constant wall thickness.

Furthermore, Kodama discloses the cylinder sleeve as essentially claimed except for the outer surface of which has at least one flattened region reaching over its entire length.

The patent to Sunada (refer to reference '771 since it is identical and in English) discloses that it is conventional in the art of cylinder sleeves to provide a cylinder sleeve 162a-162d (fig. 52), an outer surface of which has at least one flattened region reaching over its entire length.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the cylinder sleeve, as taught by Kodama, to incorporate a cylinder sleeve wherein the outer surface of which has at least one flattened region reaching over its entire length, as suggested and taught by Sunada, for the purpose of providing a lightweight engine block having much smaller wall thickness

wherein the engine block is smaller in size due to the reduced length required by the cylinder sleeves, and reducing manufacturing costs (see col. 9, lines 19-27 and 39-54).

Accordingly, Kodama and Sunada, as a combination, teaches a cylinder sleeve wherein the sleeve is configured as a rough-cast sleeve, the outer surface of which has a roughened region reaching over its entire axial length and consisting of a plurality of elevations with undercuts and wherein the height of the elevations is between 0.2 to 2 mm, wherein the cylinder sleeve has a constant wall thickness, and that the outer surface of which has at least one flattened region reaching over its entire axial length.

However, the combination of Kodama and Sunada does not teach that the **outer contour** of the cylinder sleeve consists, in cross-section, of four arc shaped segments that are approximately the same size.

On the other hand, Gobbels teaches that is it conventional in the art to provide a cylinder sleeve (see figure below) comprising an outer contour that consists, in cross-section, of four arc-shaped segments that approximately the same size.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the cylinder sleeve, as suggested and taught Kodama / Sunada, to incorporate a cylinder sleeve having an outer contour that consists, in cross section, of four arc-shaped segments that are approximately the same size, as suggested by Gobbels, for the purpose of preventing the occurrence of distortions during casting or engine operation (col. 1, lines 54-56).

Furthermore, a change in form or shape is generally recognized as being within the level of ordinary skill in the art. *In re Dailey, 149 USPQ 47 (CCPA 1976).*

Thus, the combination of Kodama and Sunada together with the teaching of Gobbels, provides a cylinder sleeve as essentially claimed.

Accordingly, the combination of Kodama / Sunada / Gobbels does teach a cylinder sleeve having an outer contour that is formed by a depth of the roughened region that is **constant over the circumference.** Thus, it is clear that the combination of Kodama / Sunada / Gobbels does not teach that the outer contour is formed by a depth of the roughened region that **varies** over a circumference.

However, the patent to Oh discloses that it conventional to provide a cylinder sleeve 1 (fig. 1-2) comprising an external surface (i.e., outer contour) that is roughened to provide protrusions 5 with undercuts (3, 15), ***wherein the depth of this roughened region is varied over the circumference of the sleeve 1*** (see col. 2, lines 1-37) for the purpose of providing a strong coupling structure between the liner and the cylinder blocks (see col. 2, lines 32-37).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the cylinder sleeve, as suggested the combination of Kodama / Sunada / Gobbels, to incorporate a cylinder sleeve wherein its outer contour is formed by **a depth of the roughened region that varies over a circumference**, as suggested and taught by Oh, for the purpose of provided a strong coupling structure between the liner and the cylinder blocks.

Thus, the entire combination leads to a cylinder sleeve for an internal combustion engine, an outer contour of which has at least one flattened region reaching over its entire axial length, and an outer contour that consists, in cross-section, of four arc

shaped segments that are approximately the same size and which is formed by a depth of the roughened region that varies over a circumference, said sleeve having a constant sleeve wall thickness, wherein the cylinder sleeve is configured as rough-cast sleeve, the outer surface of which has roughened region reaching over its entire axial length and consisting of a plurality of elevations with undercuts and wherein a height of the elevations is between 0.2 mm to 2 mm.

Response to Arguments

9. Applicant's arguments filed 07/02/2009 have been fully considered but they are not persuasive. Please refer to the above rejections for the Examiner's response the arguments. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

10. In response to applicant's argument that combining all the references cited does not lead to the cylinder sleeve as claimed, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HUNG Q. NGUYEN whose telephone number is (571) 270-5424. The examiner can normally be reached on Mon-Thu 8am - 4pm and alternate Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MICHAEL CUFF can be reached on (571) 272-6778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/HUNG Q. NGUYEN/
Examiner, Art Unit 3741

/Michael Cuff/
Supervisory Patent Examiner, Art Unit 3741